

CLAIMS:

1. (Cancelled)
2. (Original) A grating horn, comprising:  
a flat base and a pair of grating elements attached to the base, each of the grating elements being ruled with a grating period, the grating elements oriented in phase and in substantial symmetry about a normal to the flat base, such that an electron beam interacting with the grating elements produces Terahertz radiation.
3. (Original) The grating horn of claim 2, the grating elements forming a V-groove and vertex to the flat base.
4. (Original) The grating horn of claim 3, each of the grating elements being ruled perpendicular to a face of the grating element.
5. (Original) The grating horn of claim 3, the vertex intersecting the flat base.
6. (Original) The grating horn of claim 3, the vertex non-intersecting the flat base, wherein rulings of the grating elements extend between the vertex and the flat base.
7. (Original) The grating horn of claim 3, the vertex comprising a flat portion.
8. (Original) The grating horn of claim 3, wherein rulings of the grating elements are parallel to the flat base.
9. (Original) The grating horn of claim 3, wherein each of the grating elements forms a bevel edge, wherein each of the grating elements is ruled between the bevel edge and the flat base.

10. (Currently Amended) ~~The~~A grating horn of claim 3, comprising:  
a flat base; and  
a pair of grating elements attached to the flat base, each of the grating elements being  
ruled with a grating period, the grating elements oriented in phase and in  
substantial symmetry about a normal to the flat base, such that an electron  
beam interacting with the grating elements produces Terahertz radiation,  
wherein the grating elements form a V-groove and vertex to the flat base, and  
wherein each of the grating elements comprises a triangle component and a  
rectangular component, wherein each of the grating elements is ruled in the  
triangular and rectangular components and parallel to the flat base.
11. (Previously Presented) A system for generating FIR laser radiation,  
comprising:  
an electron source for generating an electron beam; and  
a grating horn having a flat base and a pair of grating elements attached to the base,  
each of the grating elements being ruled with a grating period, the grating  
elements oriented in phase and in substantial symmetry about a normal to the  
flat base, such that for interacting with the electron beam interacts with the  
grating elements to produce the FIR laser radiation.
12. (Previously Presented) The system of claim 11, further comprising optics to  
focus radiation scattered from the grating horn into a laser beam.
13. (Previously Presented) The system of claim 11, further comprising a chamber  
for housing the grating horn, and a window for transmitting the FIR radiation from inside the  
housing to outside of the housing.
14. (Previously Presented) A system for generating FIR laser radiation,  
comprising:  
an electron source for generating an electron beam; and  
a plurality of gratings, each of the gratings being positionable to a focus of the  
electron beam to interact with the electron beam to produce the FIR laser

radiation, each of the gratings being ruled differently to modify emission wavelength of the FIR radiation;

wherein one or more of the plurality of gratings comprises a grating horn having a flat base and a pair of grating elements attached to the base, each of the grating elements being ruled with a grating period, the grating elements oriented in phase and in substantial symmetry about a normal to the flat base, such that the electron beam interacts with the grating elements to produce the FIR laser radiation.

15. (Cancelled)

16. (Previously Presented) A method for generating FIR laser radiation, comprising:

generating an electron beam; and

focusing the electron beam to a grating horn, the grating horn comprising a flat base and a pair of grating elements attached to the base, each of the grating elements being ruled with a grating period, the grating elements oriented in phase and in substantial symmetry about a normal to the flat base,

wherein interaction between the electron beam and the grating elements produces the FIR laser radiation.

17. (Original) The method of claim 16, further comprising focusing the FIR radiation into a laser beam with one or more optical elements.

18. (Cancelled)